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09/929,488	08/15/2001	Kimikazu Matsumoto	250901/00	1362

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EXAMINER	
RUDE, TIMOTHY L	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/929,488
Filing Date: August 15, 2001
Appellant(s): MATSUMOTO, KIMIKAZU

Frederick E. Cooperrider
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 07 February 2005 only.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows: Claims 18-20 withdrawn from consideration as not directed to the elected invention (a display device) as originally presented. As such, these method of making claims, 18-20, are not subject to rejoinder.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Prior Art of Record

5,576,867	Baur	11-1996
6,532,053	Ohta	03-2003

(APA) Applicant's Admitted Prior Art

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-7 and 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baur et al (Baur) USPAT 5,576,867.

As to claims 1, 2, 10-12, and 14, Baur discloses in Figures 1-8 a number of embodiments of an active matrix type liquid crystal display device, comprising: a thin film transistor (TFT) substrate (col. 5, lines 56-59) having a common wiring and a source/drain wiring formed on a first substrate, said first substrate being provided with an insulating film, 8, Figure 1, covering said common wiring and said source/drain wiring, said insulating film being coated with a first alignment layer, 5, Figure 1; an

opposite substrate opposing to said TFT substrate having a second alignment layer, 6, Figure 1, formed on a second substrate; a liquid crystal held between said first alignment layer and said second alignment layer; and a stripe or line-type electrode, 9, Figure 1 (Applicant's common electrode), and a stripe or line-type electrode, 10, Figure 1 (Applicant's pixel electrode) wired in parallel with each other being formed as parts of said common wiring and said source/drain wiring, respectively.

Baur does not explicitly disclose 0.5 to 4.0 degrees.

Baur teaches that an angle made between a direction in which said first alignment layer is subjected to an aligning treatment and a direction in which said second alignment layer is subjected to an aligning treatment is set to a value of β (col. 8, lines 60-65, and col. 13, lines 39-44) is within 15 degree of 0° (overlaps Applicant's 0.5 to 4.0 degrees and 1.5 to 2.0 degrees) to produce a display with low dependence of image contrast on viewing angle (Abstract). Therefore, optimization of the results effective variable β to comprise Applicant's ranges of 0.5 to 4.0 degrees and 1.5 to 2.0 degrees would have been obvious to those having ordinary skill in the art of liquid crystals.

Baur is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to comprise an angle made between a direction in which said first alignment layer is subjected to aligning treatment and a direction in which said second alignment layer is subjected to aligning treatment is set to a value of 0.5 to 4.0 degrees or 1.5 to 2.0 degrees to produce a display with low dependence of image contrast on viewing angle.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Baur with an angle made between a direction in which said first alignment layer is subjected to aligning treatment and a direction in which said second alignment layer is subjected to aligning treatment is set to a value of 0.5 to 4.0 degrees or 1.5 to 2.0 degrees to produce a display with low dependence of image contrast on viewing angle.

Please note that Applicant's recitations of "concurrently decreasing a threshold voltage required to drive a direction change of said liquid crystal and increasing a luminance of said liquid crystal" and "narrower range additionally controlling a contrast degradation of said liquid crystal" are performance recitations that would necessarily be achieved by the claimed device structure according to Applicant's enabling disclosure.

As to claims 3, 4, and 13, Baur teaches an embodiment wherein said direction in which said first alignment layer is subjected to said aligning treatment has an angle of β_0-β (col. 8, line 60 through col. 9, line 17) where β_0 is >0° and <20° and β is 0° $\pm$ 15° which yields a maximum range of 5 to 35 degrees (overlaps Applicant's 5 to 45 degrees) (col. 10, Table 2, line D2) with respect to a parallel direction in which said common electrode and said pixel electrode are wired in parallel with each other, wherein an angle made between a direction in which said second alignment layer is subjected to aligning treatment and a direction in which said common electrode and said pixel electrode are wired in parallel with each other is larger than an angle made between said direction in which said first alignment layer is subjected to aligning

treatment and a direction in which said common electrode and said pixel electrode are wired in parallel with each other due to twist angle β being 0° ± 15°.

As to claim 5, Baur discloses a display wherein said TFT substrate and said opposite substrate having said liquid crystal therebetween include a first substrate side polarizer and a second substrate side polarizer on opposite sides opposing to inner sides of said TFT substrate and said opposite substrate facing said liquid crystal, respectively, and in said first substrate side polarizer and said second substrate side polarizer, the absorption axis and transmission axis are mutually orthogonal and Ψ is 0° or 90° (col. 9, lines 25-35, and col. 10, Table 2, line D2) (Applicant's any one of the absorption axis and the transmission axis of said first substrate side polarizer agrees with said direction in which said first alignment layer is subjected to aligning treatment).

As to claim 6, Baur discloses a display wherein a distance between surfaces of said first alignment layer and said second alignment layer opposing to each other is set to a value of 1.0 μm to 10.0 μm (col. 11, lines 44-50) (overlaps Applicant's 1.0 μm to 6.0 μm). Therefore, optimization of the results effective variable to comprise Applicant's range would have been obvious to those having ordinary skill in the art of liquid crystals.

As to claim 7, Baur discloses a display wherein a distance between said common electrode and said pixel electrode wired in parallel with each other is set to a value of

2 μm to 50 μm (col. 11, lines 47-51) (overlaps Applicant's 2 μm to 15 μm). Therefore, optimization of the results effective variable to comprise Applicant's range would have been obvious to those having ordinary skill in the art of liquid crystals.

As to claims 15-17, Baur discloses a display wherein normally black and normally white mode may be established with proper twist and/or polarizer and analyzer angles (col. 5, lines 16-27 and col. 25, lines 50-56). Also, since the contrast ratio is not infinite, some light transmittance must occur in the black display state.

2. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baur in view of Applicant's admitted prior art (APA).

As to claims 8 and 9, Baur does not explicitly disclose a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor film is formed in said insulating film, and said island constitutes an active region of a thin film transistor. However, these are merely common knowledge means of comprising a satisfactory TFT display configuration.

Applicant's admitted prior art (APA) discloses these claimed features in Applicant's Figures 1A and 1B to comprise a satisfactory TFT display configuration.

FIG.1A(PRIOR ART)

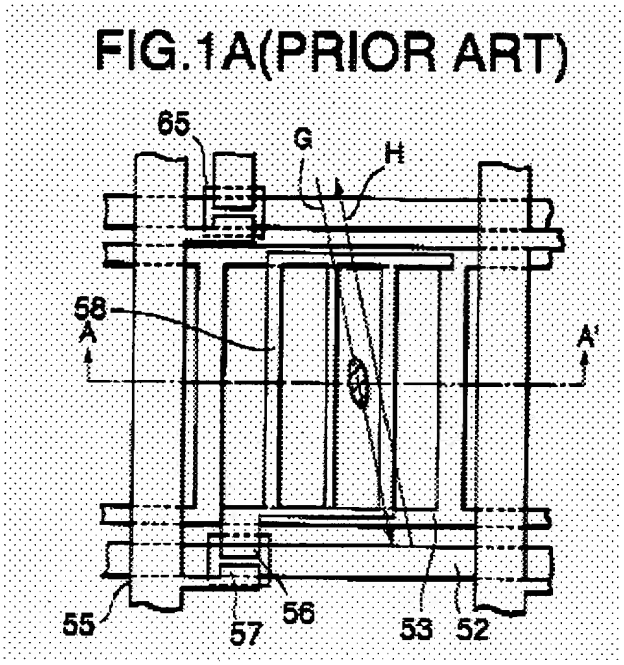
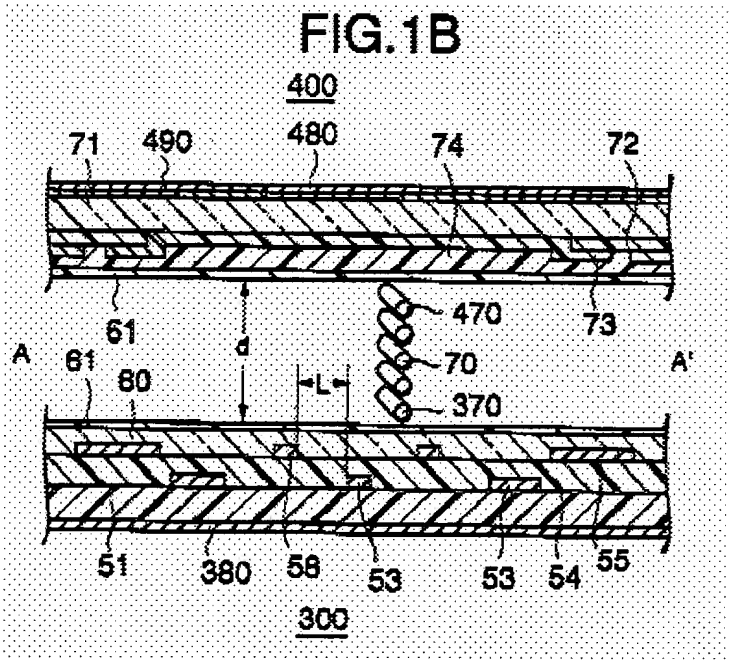


FIG.1B



APA is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor

film is formed in said insulating film, and said island constitutes an active region of a thin film transistor to comprise a satisfactory TFT display configuration.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Baur with a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor film is formed in said insulating film, and said island constitutes an active region of a thin film transistor of APA to comprise a satisfactory TFT display configuration.

3. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baur in view of Ohta et al (Ohta) USPAT 6,532,053 B2.

As to claims 8 and 9, Baur does not explicitly disclose a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor film is formed in said insulating film, and said island constitutes an active region of a thin film transistor. However, these are merely common knowledge means of comprising a satisfactory TFT display configuration.

Ohta discloses these claimed features in Figures 2 and 3 to comprise a satisfactory TFT display configuration with *inter alia* wide viewing angle (Abstract).

FIG.2

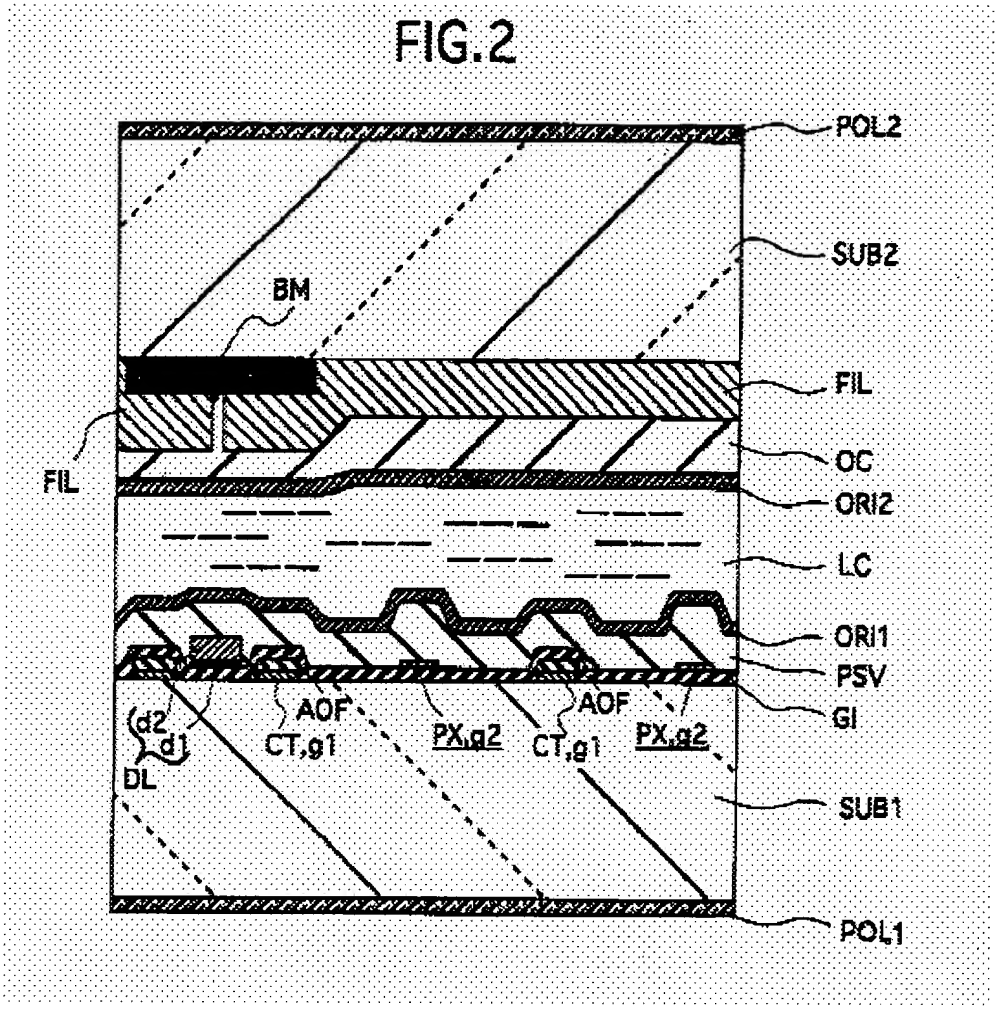
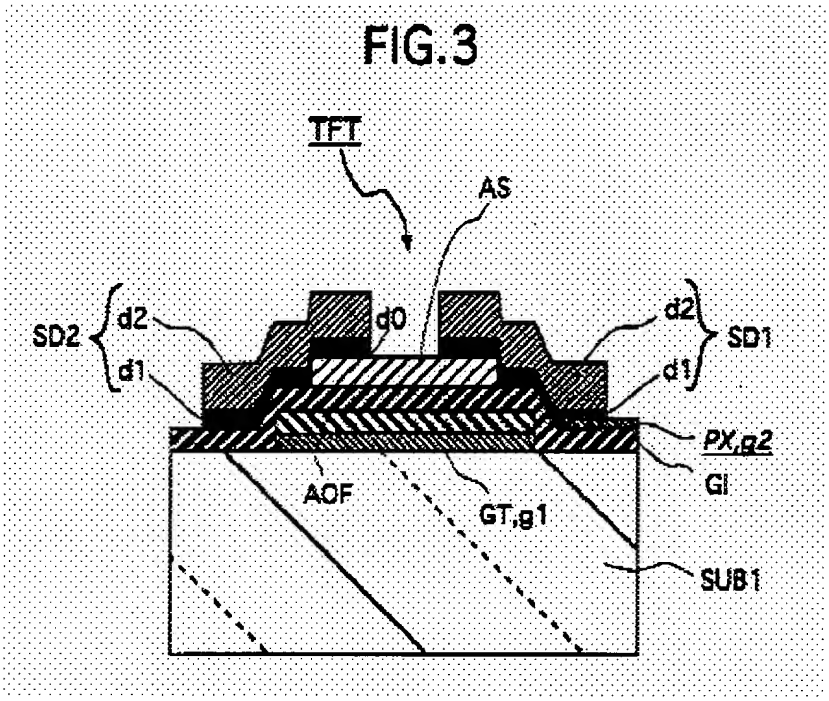

POL2
SUB2
BM
FIL
FIL
OC
ORI2
LC
ORI1
PSV
GI
AOF
AOF
(d2
d1
CT,g1
PX,g2
CT,g1
PX,g2
DL
SUB1
POL1

FIG.3



Ohta is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor film is formed in said insulating film, and said island constitutes an active region of a thin film transistor to comprise a satisfactory TFT display configuration with wide viewing angle.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Baur with a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor film is formed in said insulating film, and

said island constitutes an active region of a thin film transistor of Ohta to comprise a satisfactory TFT display configuration with wide viewing angle.

4. Claims 1-7 and 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baur in view of Ohta et al (Ohta2) USPAT 6,266,116 B1.

As to claims 1, 2, 10-12, and 14, Baur discloses in Figures 1-8 a number of embodiments of an active matrix type liquid crystal display device, comprising: a thin film transistor (TFT) substrate (col. 5, lines 56-59) having a common wiring and a source/drain wiring formed on a first substrate, said first substrate being provided with an insulating film, 8, Figure 1, covering said common wiring and said source/drain wiring, said insulating film being coated with a first alignment layer, 5, Figure 1; an opposite substrate opposing to said TFT substrate having a second alignment layer, 6, Figure 1, formed on a second substrate; a liquid crystal held between said first alignment layer and said second alignment layer; and a stripe or line-type electrode, 9, Figure 1 (Applicant's common electrode), and a stripe or line-type electrode, 10, Figure 1 (Applicant's pixel electrode) wired in parallel with each other being formed as parts of said common wiring and said source/drain wiring, respectively.

Baur does not explicitly disclose 0.5 to 4.0 degrees.

Ohta2 teaches (first embodiment, col. 4, lines 32-34, col. 18, lines 58-62, and col. 19, lines 33-37) that an angle made between a direction in which said first alignment

layer is subjected to an aligning treatment and a direction in which said second alignment layer is subjected to an aligning treatment is set to a value of β (col. 8, lines 60-65, and col. 13, lines 39-44) is within 5 degree of 0° (overlaps Applicant's 0.5 to 4.0 degrees and 1.5 to 2.0 degrees) to produce a display with low dependence of image contrast on viewing angle in a fixed driving voltage range (reduced voltage with adequate response speed). Therefore, optimization of the results effective variable β to comprise Applicant's ranges of 0.5 to 4.0 degrees and 1.5 to 2.0 degrees would have been obvious to those having ordinary skill in the art of liquid crystals.

Ohta2 is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to comprise an angle made between a direction in which said first alignment layer is subjected to aligning treatment and a direction in which said second alignment layer is subjected to aligning treatment is set to a value of 0.5 to 4.0 degrees or 1.5 to 2.0 degrees to produce a display with low dependence of image contrast on viewing angle in a fixed driving voltage range with reduced voltage with adequate response speed (faster speed allowing lower driving voltage).

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Baur with an angle made between a direction in which said first alignment layer is subjected to aligning treatment and a direction in which said second alignment layer is subjected to aligning treatment is set to a value of 0.5 to 4.0 degrees or 1.5 to 2.0 degrees of Ohta2 to produce a display with low dependence of image contrast on viewing angle in a fixed driving voltage range with reduced voltage with adequate response speed.

As to claims 3, 4, and 13, Baur teaches an embodiment wherein said direction in which said first alignment layer is subjected to said aligning treatment has an angle of β_0-β (col. 8, line 60 through col. 9, line 17) where β_0 is >0° and <20° and β is 0° $\pm$ 15° which yields a maximum range of 5 to 35 degrees (overlaps Applicant's 5 to 45 degrees) (col. 10, Table 2, line D2) with respect to a parallel direction in which said common electrode and said pixel electrode are wired in parallel with each other, wherein an angle made between a direction in which said second alignment layer is subjected to aligning treatment and a direction in which said common electrode and said pixel electrode are wired in parallel with each other is larger than an angle made between said direction in which said first alignment layer is subjected to aligning treatment and a direction in which said common electrode and said pixel electrode are wired in parallel with each other due to twist angle β being 0° $\pm$ 15°.

As to claim 5, Baur discloses a display wherein said TFT substrate and said opposite substrate having said liquid crystal therebetween include a first substrate side polarizer and a second substrate side polarizer on opposite sides opposing to inner sides of said TFT substrate and said opposite substrate facing said liquid crystal, respectively, and in said first substrate side polarizer and said second substrate side polarizer, the absorption axis and transmission axis are mutually orthogonal and Ψ is 0° or 90° (col. 9, lines 25-35, and col. 10, Table 2, line D2) (Applicant's any one of the

absorption axis and the transmission axis of said first substrate side polarizer agrees with said direction in which said first alignment layer is subjected to aligning treatment).

As to claim 6, Baur discloses a display wherein a distance between surfaces of said first alignment layer and said second alignment layer opposing to each other is set to a value of 1.0 μm to 10.0 μm (col. 11, lines 44-50) (overlaps Applicant's 1.0 μm to 6.0 μm). Therefore, optimization of the results effective variable to comprise Applicant's range would have been obvious to those having ordinary skill in the art of liquid crystals.

As to claim 7, Baur discloses a display wherein a distance between said common electrode and said pixel electrode wired in parallel with each other is set to a value of 2 μm to 50 μm (col. 11, lines 47-51) (overlaps Applicant's 2 μm to 15 μm). Therefore, optimization of the results effective variable to comprise Applicant's range would have been obvious to those having ordinary skill in the art of liquid crystals.

As to claims 15-17, Baur discloses a display wherein normally black and normally white mode may be established with proper twist and/or polarizer and analyzer angles (col. 5, lines 16-27 and col. 25, lines 50-56). Also, since the contrast ratio is not infinite, some light transmittance must occur in the black display state.

5. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baur in view of Ohta2 and further in view of Applicant's admitted prior art (APA).

As to claims 8 and 9, Baur in view of Ohta2 disclose the display above.

Baur in view of Ohta2 does not explicitly disclose a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor film is formed in said insulating film, and said island constitutes an active region of a thin film transistor. However, these are merely common knowledge means of comprising a satisfactory TFT display configuration.

Applicant's admitted prior art (APA) discloses these claimed features in Applicant's Figures 1A and 1B to comprise a satisfactory TFT display configuration.

FIG.1A(PRIOR ART)

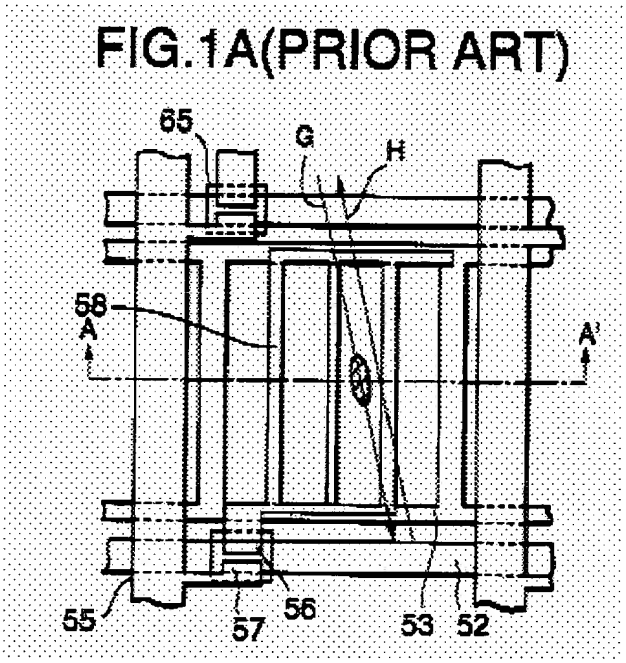
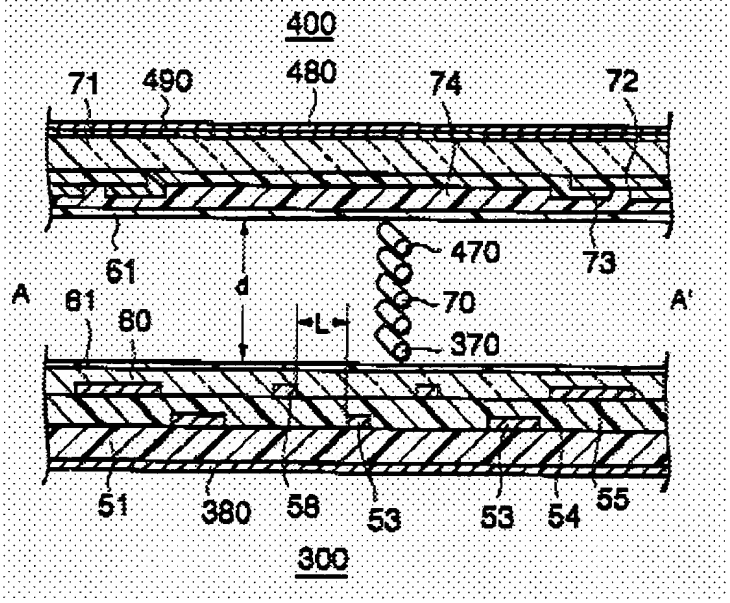


FIG.1B



APA is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor film is formed in said insulating film, and said island constitutes an active region of a thin film transistor to comprise a satisfactory TFT display configuration.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Baur in view of Ohta2 with a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor film is formed in said insulating film, and said island constitutes an active region of a thin film transistor of APA to comprise a satisfactory TFT display configuration.

6. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baur in view of Ohta2 in view of Ohta et al (Ohta) USPAT 6,532,053 B2.

As to claims 8 and 9, Baur in view of Ohta2 disclose the display above.

Baur in view of Ohta2 does not explicitly disclose a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor film is formed in said insulating film, and said island constitutes an active region of a thin film transistor. However, these are merely common knowledge means of comprising a satisfactory TFT display configuration.

Ohta discloses these claimed features in Figures 2 and 3 to comprise a satisfactory TFT display configuration with *inter alia* wide viewing angle (Abstract).

FIG.2

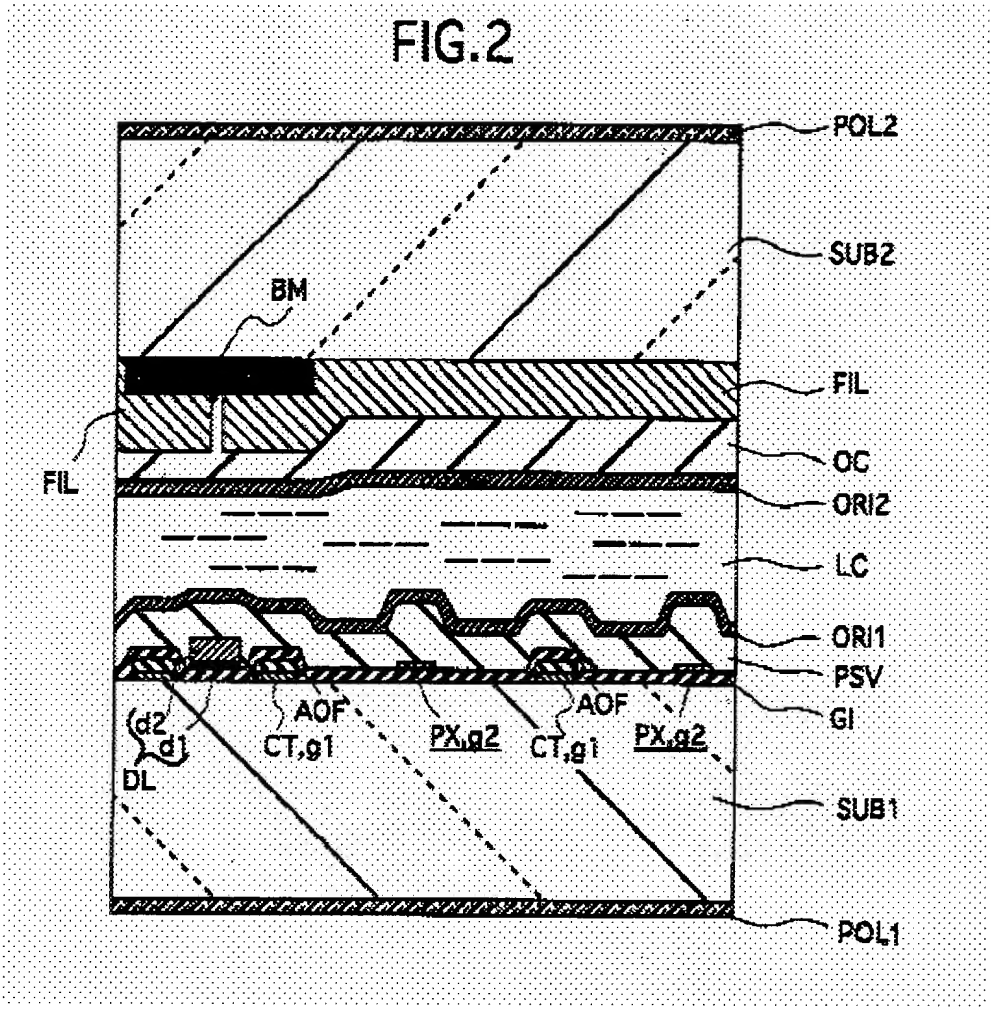
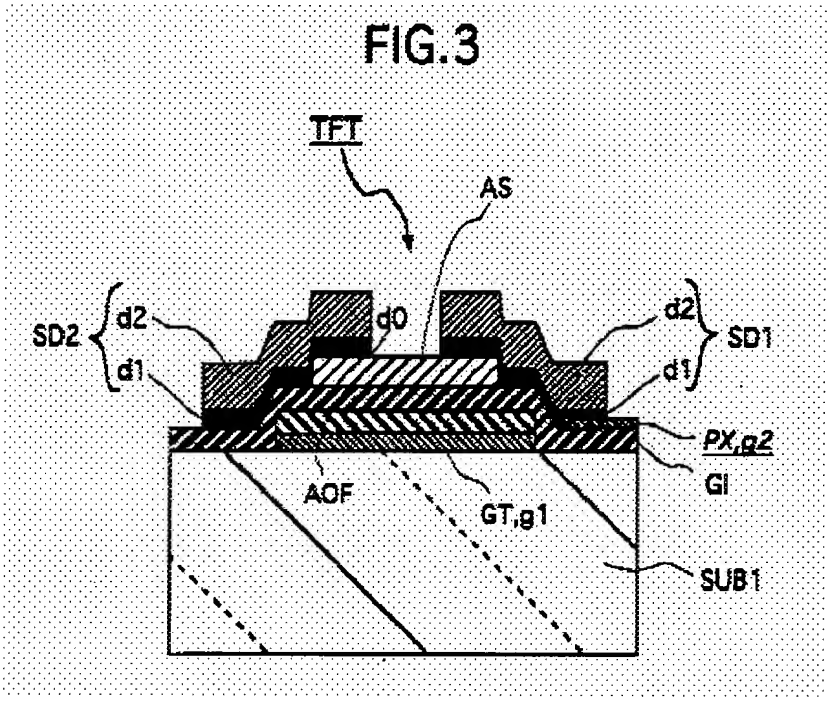

POL2
SUB2
BM
FIL
FIL
OC
ORI2
LC
ORI1
PSV
GI
AOF
AOF
d2
d1
DL
CT,g1
PX,g2
CT,g1
PX,g2
SUB1
POL1

FIG.3



Ohta is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor film is formed in said insulating film, and said island constitutes an active region of a thin film transistor to comprise a satisfactory TFT display configuration with wide viewing angle.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Baur in view of Ohta2 with a display wherein a gate wiring of a thin film transistor is formed on said first substrate simultaneously with said common wiring and wherein an island disposed above said common wiring and made of a semiconductor film is formed in said

insulating film, and said island constitutes an active region of a thin film transistor of Ohta to comprise a satisfactory TFT display configuration with wide viewing angle.

(10) Response to Argument

Regarding Appellant's argument B, examiner maintains Baur does teach Appellant's twist angle is a results effective variable wherein the teaching of Baur is robust to explain to those of ordinary skill in the art of liquid crystals at the time the claimed invention was made that one can establish Appellant's claimed twist angle as a matter of tuning for a particular application, e.g., for a high ambient light or low ambient light application [implicit disclosure MPEP 2144.01]. It is clear from the prior art that a plurality of parameters are adjusted as a set to achieve desired results. Naturally, the disclosure and claims of Baur include a range of twist angles that is wide enough to include a broad range of displays useful in a broad range of applications, thereby providing ample patent protection for the invention of Baur. Simply claiming a narrower range within the range of Baur is insufficient for patentability.

Please note that Appellant's arguments repeatedly use the words "tilt angle" for - - twist angle - -. Examiner believes the issues on appeal have to do with twist angle. Tilt angle is a parameter that is real in the art of liquid crystals, different from twist angle, and not at issue in this appeal.

Appellant repeatedly refers to unexpected results, however, examiner is unable to find any evidence of said unexpected results. Examiner pointed out the need for some engineering evidence of a contrary (contrary to applied prior art) results effective

variable. Basically, the teachings of Bauer would lead one of ordinary skill in the art of liquid crystals at the time the claimed invention was made to expect the results of Appellant given mere routine experimentation. For example, it is clear from Baur that increasing the twist angle to something greater than zero will improve switching speed and reduce switching voltage, because the small twist angle mechanically approaches the on condition. That is to say, it becomes quicker and easier to turn it on because the twist turns it on part of the way and thereby aids the voltage in turning on the device. The penalty is reduced contrast (moving further from the off state), but this is acceptable especially for low ambient light applications due to the insensitivity of the human eye.

Appellant's specification and Figures do not show any unexpected results. Appellant's specification and Figures merely teach the above relationships that would be clearly understood from Baur by those having ordinary skill in the art of liquid crystals at the time the claimed invention was made.

Appellant claims unexpected results are shown in Appellant's graphs and figures, but Appellant does not direct our attention to any specific graph or figure. As a result, examiner hunted for the claimed unexpected results but found none:

Figures 2A and 2B teach the expected behavior of the molecules in the off and on conditions for a small twist angle LCD with in-plane switching.

Figure 3 merely illustrates that electric field strength is expected to fall off (get smaller) with increased distance.

Figure 6 merely illustrates that the LCD, as expected, will turn on at lower voltage when it is partially initially turned on the by small twist angle.

Figure 7 merely illustrates that the LCD, as expected, will take less time to turn on when it requires less voltage to accumulate (over less time) and when it is partially initially turned on the by small twist angle.

Examiner could not find any teaching or illustration by Appellant that disclosed any unexpected "sweet spot" or contrary trend that would not be expected from the teachings of Baur.

Examiner recommends we establish early in these proceedings just what it is Appellant considers to be "unexpected results". A board decision might be quickly reached by simply establishing what the Office means by unexpected result and that no relevant unexpected result is known to Appellant.

Please consider MPEP 716.01(c) [R2] I and II, which cites *In re De Blauwe,* 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984) ("it is well settled that unexpected results must be established by factual evidence." "[A]ppellants have not presented any experimental data showing ... . Due to the absence of tests comparing appellant's ... with those of the closest prior art, we conclude that appellant's assertions of unexpected results constitute mere argument.").

Regarding Appellant's claim that examiner's position is flawed as a matter of fact, the applied prior art does not need to teach the need to "separately adjust twist (Appellant's tilt) angle". Baur is considered a robust teaching that goes beyond merely teaching the value of twist angles throughout Appellant's claimed range. Examiner maintains Baur does teach *inter alia* Appellant's twist angle is a results effective variable

wherein the teaching of Baur is robust to explain to those of ordinary skill in the art of liquid crystals at the time the claimed invention was made that one can establish Appellant's claimed twist angle as a matter of tuning for a particular application, e.g, for a high ambient light or low ambient light application [implicit disclosure MPEP 2144.01].

Regarding Appellant's ISSUE #2, A, examiner can only glean expected results from Appellant's disclosure and responses. Examiner has tried to explain to Appellant the burden of proof needed to establish an unexpected result.

Regarding Appellant's ISSUE #2, B, Appellant claims the disclosure supports the narrow range of Baur, but examiner cannot find the justification for the upper limit of twist angle that would need to be based upon unexpected results, e.g., something gets unexpectedly worse when exceeding Appellant's upper limit of the twist angle range.

Also, the applied prior art does not need to teach Appellant's narrower claimed range because no unexpected result has been established by Appellant.

Regarding Appellant's second claim that examiner's position is flawed as a matter of fact, the applied prior art does not need to teach Appellant's narrower claimed range because no unexpected result has been established by Appellant.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Timothy L Rude
Examiner
Art Unit 2883

tlr
April 18, 2005

Conferees

Frank G. Font

Georgia Y. Epps

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